

of the claims." Then, on page 3, lines 4 and 5, the Office Action states "it however does not teach explicitly that the second holographic structure is a volume hologram." These two statements are contradictory. Thus, Applicant respectfully submits that the Office Action does not "clearly articulate [the] rejection ... so that the Applicant has the opportunity to provide evidence of patentability and otherwise reply completely at the earliest opportunity" as required by MPEP §706. Such inconsistencies render the Office Action difficult and/or impossible to comprehend. As such, Applicant respectfully submits that the Office Action has failed to meet the requirements of MPEP §706.

Nonetheless, Applicant has endeavored to understand the rejections and respond to them to the extent practicable.

Claim 71 recites "the first structure having a surface relief microstructure and including a reflective layer formed by a high refractive index dielectric material, the second optically variable effect generating structure being a volume hologram viewable through the first optically variable effect generating structure." The Office Action appears to admit that Mallik fails to disclose that the second holographic structure is a volume hologram, but alleges that both embossed holograms and volume holograms are well known, citing Heckenkamp. The Office Action further alleges "[i]t would then have been obvious to one skilled in the art to select one type than the other such as to replace embossed hologram by volume hologram for the purpose of design choice and for the purpose of providing better diffraction efficiency." See the Office Action at page 3. Applicant respectfully disagrees with the Office Action's assertion of obviousness.

Although both embossed holograms and volume holograms may be known in the art, that, alone, is insufficient to establish that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine them as recited in claim 71. None of the applied references support such an assertion as set forth in the Office Action.

Heckenkamp describes a product involving a single hologram, either an embossed hologram or a volume hologram. Nowhere does Heckenkamp suggest that two different types of holograms could be combined together. Further, one of ordinary skill in the art would not have considered combining the two different types of holograms together because they respond to incident light in very different ways. A surface relief hologram will reflect light over a large range of wavelengths whereas a reflection or Bragg hologram reflects within a narrow range of wavelengths. These two types of holograms are mutually incompatible in the way in which they produce a hologram and therefore it would not have been obvious to one of ordinary skill in the art to combine them.

Also, Mallik describes a combination of two surface relief holograms whereas Yu describes stacked volume holograms. None of the prior art suggests combining a surface relief hologram and a volume hologram. The fact that no prior art has been cited that even suggests such a combination is possible is strong evidence that such a combination would not have been obvious to one of ordinary skill in the art.

Claim 71 recites "at least first and second superposed diffractive or holographic optically variable effect generating structures ... whose optically variable generating effect appears to derive from one optical effect generating structure." The Office Action, on page 4, alleges "[a]lthough Mallik teaches one design of viewing one reconstructed image from one of the holograms at a time, this actually means it is within the general level of skill of a worker in the art to design reconstructed holographic images from the two holograms to be seen in integrated manner or independent manner." The Office Action provides absolutely no factual basis for this assertion. Because the Office Action has provided no factual basis for this assertion, Applicants respectfully submit that Mallik does not disclose that it is within the level of ordinary skill in the art to design reconstructed holographic images from two

holograms to be seen in an integrated manner. Consequently, the applied references fail to disclose, and would not have rendered obvious, the above-quoted features of claim 71.

The Office Action, on page 4, alleges that Yu "teaches multiple layer holograms with stacked hologram layers that each reconstructs a separate image and the separate images are superimposed and combined to provide a single visually integrated image that appears as single hologram diffracting from a single optical effect generating structure." Applicant respectfully submits that this statement mischaracterizes the disclosure of Yu. Yu discloses reflective display holograms (see, for example, col. 1, line 13), and the stacked hologram structure referred to in Yu (see, for example, col. 2, lines 26-37) describes a stack of holograms that operate independently from one another. For example, in the case of a windshield, one hologram projects images to a viewer and a second hologram functions to block or prevent light from entering the car. Yu at col. 2, lines 30-34. There is no suggestion that the image from one hologram is viewed in combination with the image from the second hologram. Thus, one of ordinary skill in the art would not combine Mallik and Yu as alleged in the Office Action.

Claim 71 recites "the first structure having a surface relief microstructure and including a reflective layer formed by a high refractive index dielectric material." The Office Action admits that Mallik fails to disclose these features but alleges that Cueli overcomes the deficiencies of Mallik. The Office Action alleges that Cueli discloses the claimed high refractive index dielectric material and "[i]t would have been obvious to one skilled in the art to make the reflective layer a high refractive index dielectric material for the benefit of making the reflective layer a semi-transparent reflective layer to allow the second relief hologram be viewed without obstruction." Applicant respectfully disagrees because combining the disclosure of Mallik and Cueli would not have been obvious to one of ordinary skill in the art. The discontinuous reflective layer in Mallik is an aluminum layer that acts as

an opaque mask through which the image formed by the other surface relief hologram can be seen. On tilting, it would become immediately apparent that the images from the two holograms were not integrated but in fact were two separate images. The presence of a metal layer 25 in Mallik is very important. The Office Action admits as much on page 4, lines 13-14, in stating "Mallik teaches one design of viewing one reconstructed image from one of the holograms at a time." In other words, Mallik clearly does not teach the viewing of a combined image from both holograms at the same time.

The Office Action goes on to state "this actually means it is within the general level of skill of a worker in the art to design reconstructed holographic images from the two holograms to be seen in one integrated manner or independent manner." There is no basis for this statement because it is completely in opposition to the clear teaching of Mallik. Mallik teaches using a reflective metallic mask and this is completely contrary to the features of claim 71 which include "a high refractive index dielectric material...wherein the replay characteristics of the structures generate a visually integrated image."

Claim 87 recites a method for manufacturing a security device with features similar to those recited above with respect to claim 71. Thus, claim 87 is patentable at least for the reasons discussed above with respect to claim 71.

Claims 74, 75, 77, 79, 80, 82-86, 88, 89, 93-95 and 98-103 are patentable by reason of their dependency from one of independent claims 71 and 87, as well as for the additional features they recite. Applicant respectfully requests withdrawal of the rejection.

The Office Action rejects claims 76, 81 and 90 under 35 U.S.C. §103(a) over Mallik in view of Heckenkamp, Yu, Cueli and Staub et al., U.S. Patent No. 5,886,798. Applicant respectfully traverses the rejection.

The rejection of these claims is premised upon the combination of Mallik, Heckenkamp, Yu and Cueli disclosing all the features of independent claims 71 and 87. As

discussed above, these references fail to do so. Further, Staub fails to overcome the deficiencies of these references. Thus, claims 76, 81 and 90 are patentable by reason of their dependency from one of independent claims 71 and 87, as well as for the additional features they recite. Applicant respectfully requests withdrawal of the rejection.

The Office Action rejects claims 78 and 97 under 35 U.S.C. §103(a) over Mallik in view of Heckenkamp, Yu, Cueli and Ishibashi et al., U.S. Patent No. 6,861,388. Applicant respectfully traverses the rejection.

The rejection of claims 78 and 97 is premised upon the combination of Mallik, Heckenkamp, Yu and Cueli disclosing all the features of independent claims 71 and 87. As discussed above, these references fail to do so. Further, Ishibashi fails to overcome the deficiencies of these references. Thus, claims 78 and 97 are patentable by reason of their dependency from one of independent claims 71 and 87, as well as for the additional features they recite. Applicant respectfully requests withdrawal of the rejection.

The Office Action rejects claim 96 under 35 U.S.C. §103(a) over Mallik in view of Heckenkamp, Yu, Cueli and Kaule et al., U.S. Patent No. 6,294,241. Applicant respectfully traverses the rejection.

The rejection of claim 96 is premised upon the combination of Mallik, Heckenkamp, Yu and Cueli disclosing all the features of independent claim 87. As discussed above, these references fail to do so. Further, Kaule fails to overcome the deficiencies of these references. Thus, claim 96 is patentable by reason of its dependency from independent claim 87, as well as for the additional features it recites. Applicant respectfully requests withdrawal of the rejection.

The Office Action rejects claims 104, 106, 107, 109, 111-120, 122, 123 and 126-131 under 35 U.S.C. §103(a) over Mallik in view of Heckenkamp and Yu. Applicant respectfully traverses the rejection.

Claim 104 recites "the first optically variable effect generating structure includes a discontinuous metallic layer, registered with the surface relief microstructure of the first optically variable effect generating structure." Claim 117 recites "providing the surface relief microstructure of the first optically variable effect generating structure with a discontinuous reflective metal layer registered with the surface relief microstructure of the first optically variable effect generating structure." The applied references fail to disclose these features for the reasons set forth in the February 26, 2009 Amendment and the September 9, 2009 Amendment. In the outstanding Office Action and the previous Office Action, no explanation has been given as to why the applied references allegedly disclose these features. Applicant respectfully requests that the next Office Action either allow these claims or clearly and explicitly set forth reasoning as to why these claims are not patentable, including the above-referenced features as required by at least MPEP §706.

The arguments regarding these features as set forth in the previous two Amendments are repeated herein for the Examiner's convenience.

Applicant respectfully submits that claims 104-131 are patentable for at least the following reasons.

These claims relate to the embodiment in which there are two superposed surface relief microstructures. Importantly, a discontinuous metallic layer is provided in conjunction with the first microstructure in register with the microstructure. The significance of the term "in register" is that it means metal is provided in all regions where there is microstructure but not in regions where there is no microstructure. This means that the brightness of the first holographic optically variable effect generating structure can be maintained but at the same time the underlying second structure is visible.

This should be contrasted with the invention of Mallik in which a regular array of spots 25 of reflective material is provided associated with the surface relief hologram 23. It

can readily be seen in Mallik's Figure 11 that some regions of that hologram are not provided with the metallic spots 25 which means that the optimum replay brightness of that hologram is immediately reduced. It can be seen in Mallik's Figure 11 that about 50% of the surface of the hologram 23 is provided with metallic spots meaning that there will be a 50% reduction in brightness. On the other hand, with applicant's claims, the microstructure is fully covered by a metallic layer and full brightness is maintained because the metallic layer is provided in register with the microstructure. The underlying hologram in the invention is viewed through non-embossed regions of the layer provided in the first structure.

Claim 104 recites "a dye or pigment is provided between the optically variable effect generating structures." Claim 117 recites "providing a dye or pigment between the optically variable effect generating structures." The Office Action alleges that Mallik teaches using a printed photograph 15 or writing 13 and that this printed photograph or writing may include or be modified to include dye or pigment to make the printed information have a color appearance. The Office Action also alleges that Heckenkamp discloses using a dye that can be used in a printing process to provide color to a holographic security device, citing col. 10, lines 13-20 and 29-32. But, neither reference discloses that the use of such printing or pigment is between the optically variable effect generating structures. Further, none of the applied references provide any motivation to do so. Therefore, the above-quoted features are neither disclosed, nor would they have been obvious to one of ordinary skill in the art.

Yu fails to overcome the above-noted deficiencies.

Claims 106, 107, 109, 111-116, 118-120, 122, 123 and 126-131 are patentable by reason of their dependency from one of independent claims 104 and 117, as well as for the additional features they recite. Applicant respectfully requests withdrawal of the rejection.

The Office Action rejects claims 108, 113 and 121 under 35 U.S.C. §103(a) over Mallik in view of Heckenkamp, Yu and Staub. Applicant respectfully traverses the rejection.

The rejection of these claims is premised upon the combination of Mallik, Heckenkamp and Yu disclosing all the features of independent claims 104 and 117. As discussed above, these references fail to do so. Further, Staub fails to overcome the deficiencies of these references. Thus, claims 108, 113 and 121 are patentable by reason of their dependency from one of independent claims 104 and 117, as well as for the additional features they recite. Applicant respectfully requests withdrawal of the rejection.

Claims 110 and 125 are rejected under 35 U.S.C. §103(a) over Mallik in view of Heckenkamp, Yu and Ishibashi. Applicant respectfully traverses the rejection.

The rejection of these claims is premised upon the combination of Mallik, Heckenkamp and Yu disclosing all the features of independent claims 104 and 117. As discussed above, these references fail to do so. Thus, claims 110 and 125 are patentable by reason of their dependency from one of independent claims 104 and 117, as well as for the additional features they recite. Applicant respectfully requests withdrawal of the rejection.

Claim 124 is rejected under 35 U.S.C. §103(a) over Mallik in view of Heckenkamp, Yu and Kaule. Applicant respectfully traverses the rejection.

The rejection of claim 124 is premised upon the combination of Mallik, Heckenkamp and Yu disclosing all the features of claim 117. As discussed above, these references fail to do so. Thus, claim 124 is patentable by reason of its dependency from claim 117, as well as for the additional features it recites. Applicant respectfully requests withdrawal of the rejection.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.



Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachments:

Petition for Extension of Time  
Request for Suspension of Action

Date: May 14, 2010

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